

## RESEARCH INTERESTS

- The cell signaling problem
- Developing detailed models of the signaling cascades initiated by ligand-induced receptor aggregation
- Developing a detailed model of the events that result in histamine release from mast cells and basophils during an allergic reaction
- The competition between inter- and intramolecular binding reactions during cell signaling
- Reactions that occur on cell surfaces.
- Interactions between antibodies and their epitopes

I have a strong interest in the dynamics of cell surface receptors and how they mediate cell signaling. For some time my work has focused on modeling signaling initiated by immune recognition receptors, and in particular, the receptor that binds IgE with high affinity. This receptor, FcεRI, is expressed on the surface of mast cells and basophils and plays a central role in allergic reactions. When an allergen (a multivalent ligand) binds to IgE and induces receptors to aggregate, mast cells and basophils often respond by releasing histamine and other mediators of anaphylaxis. The early events initiated by the aggregation of FcεRI are similar to those initiated by other immune-response receptors such as the B cell receptor. Building detailed models of cell-signaling cascades offers serious challenges to the modeler.